



国立大学法人
熊本大学



France-Asia Research Collaboration Project

ICT-PAMM

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Dr. Zhencheng Hu, A.Prof.

Introduction of Kumamoto University

Kumamoto, Japan

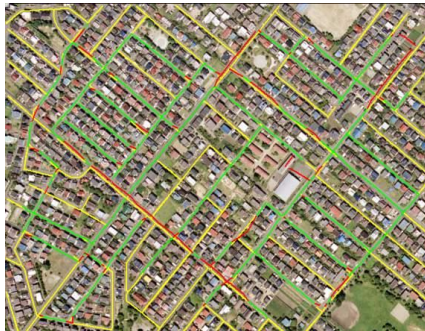
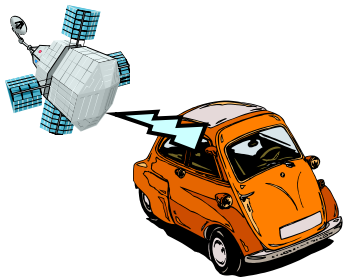
熊本市 Kumamoto City, Japan



ITS Research Lab, Kumamoto University

- Computer vision and ITS

- Sensing and perception technology for Adaptive Driving Assistance System
- Driver inattention monitoring system
- In-vehicle Navigation with new HMI
- Parking Assistance System
- Personal EV: new mobility for the elder society
- Satellite image processing for digital map



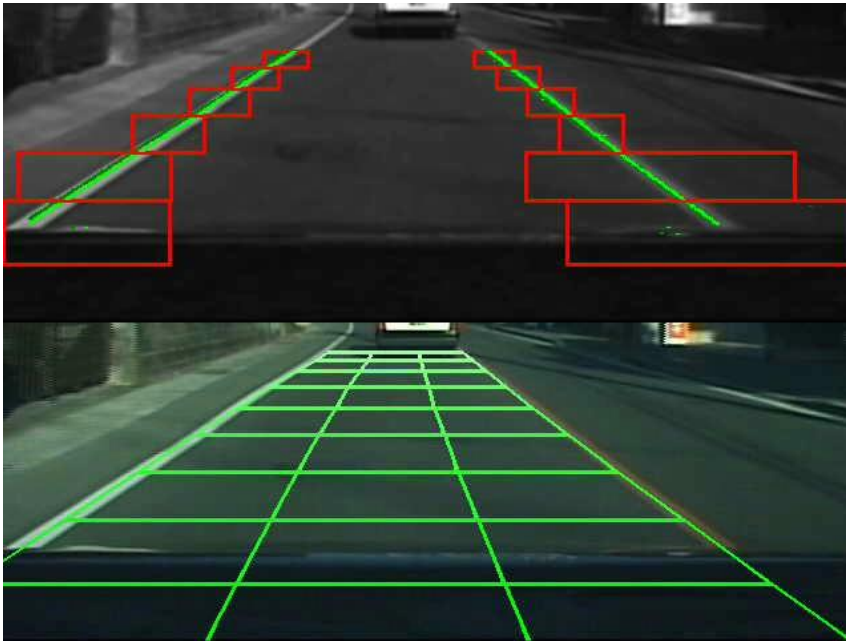
▶ Visit us at <http://navi.cs.kumamoto-u.ac.jp>

Research Partners 共同研究パートナーズ

- ▶ Domestic: Nissan, Honda, SUZUKI, Renesas Electronics, Mitsubishi, Toshiba Teli, Zenrin, etc.
- ▶ International: Institute Pascal (or LASMEA, France), McMaster (Canada), Tongji Univ., Shanghai Jiaotong Univ., Jilin Univ. (China), etc.



Advanced Sensing 車載先進センシング技術



Night

ナビ情報と統合するロバストな車線検出技術
Predictive Lane Detection Technology



実写映像ナビ Direct Visual Navigation

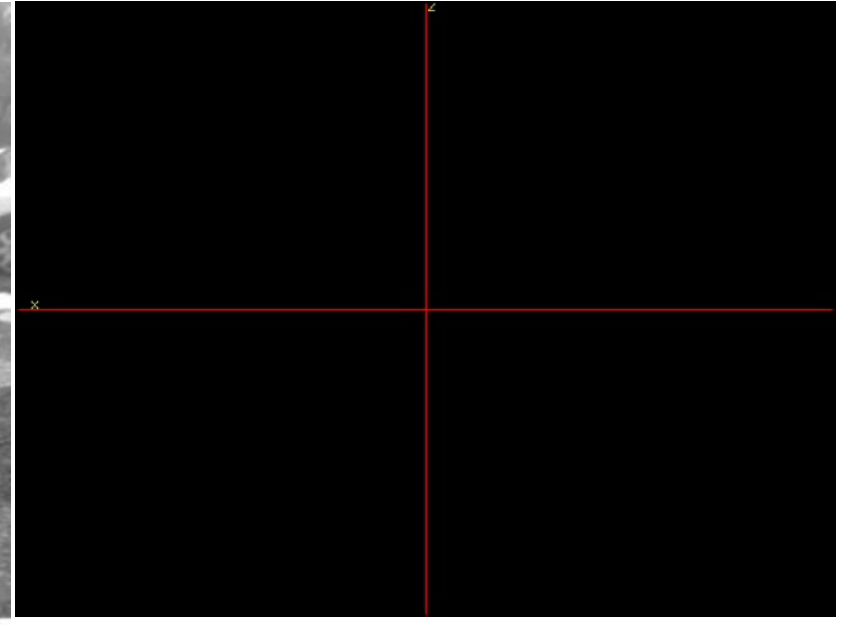
- ▶ 実写映像をベースとなる新しいカーナビ
 - ▶ Direct visual information superimposed onto real scene
 - ▶ Form a basis of new generation of in-vehicle navigation



高精度画像測位技術 Visual SLAM

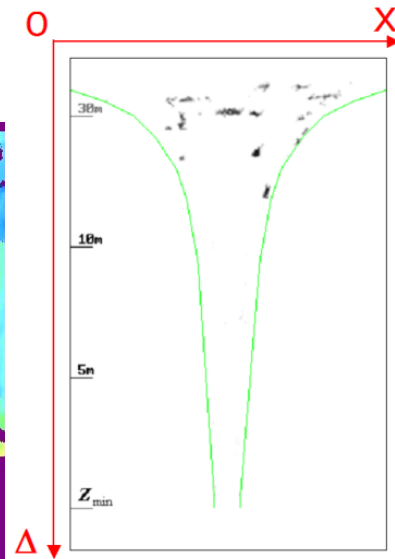
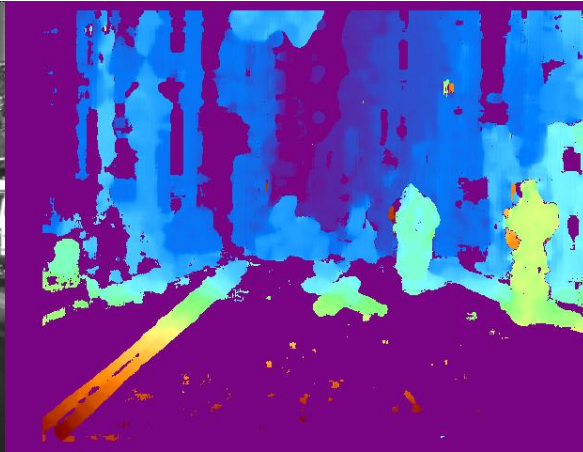
▶ ステレオ画像センサによる高精度測位技術

Stereo Visual SLAM based localization technology



センサフュージョン Sensor Fusion on Road

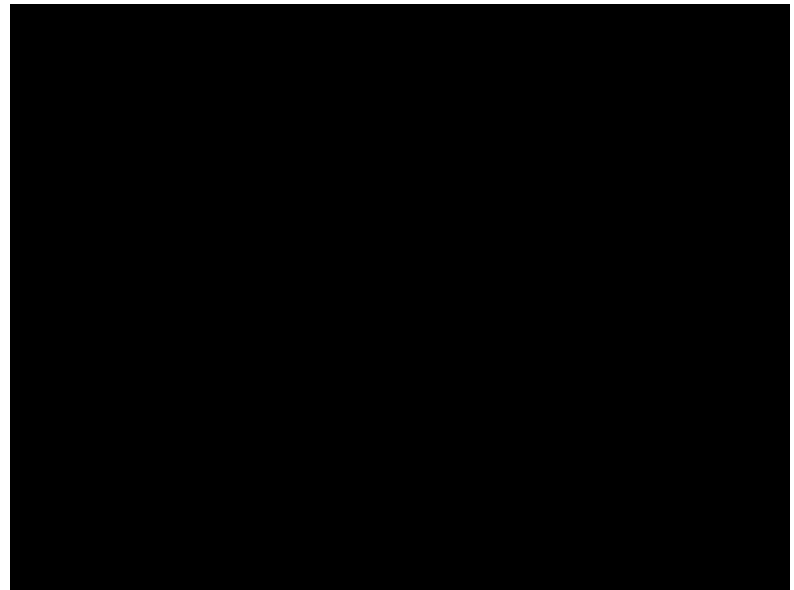
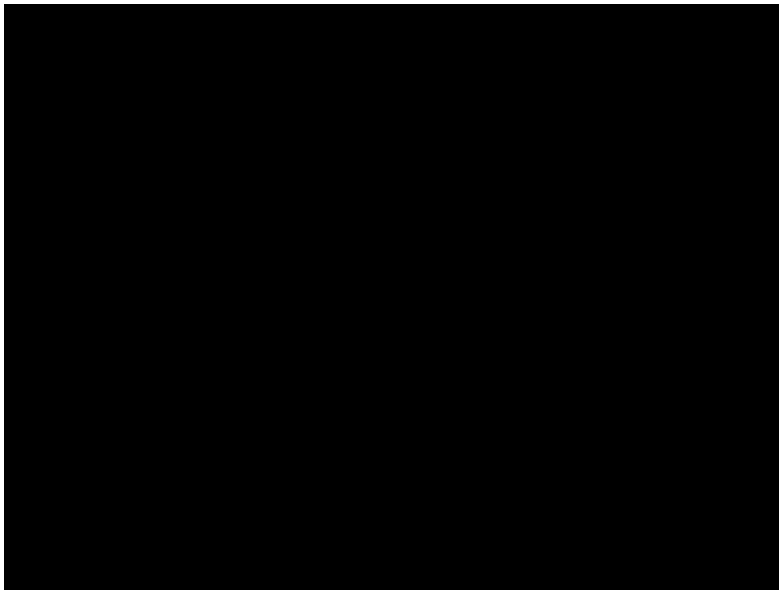
- ▶ Stereo vision, Laser radar based Obstacle Detection System for Full Speed Range ACC



駐車支援技術 Parking Assistance System

- ▶ アラウンドビューと可視レーダによる駐車支援技術

Around view camera system and visible radar based parking assistance system



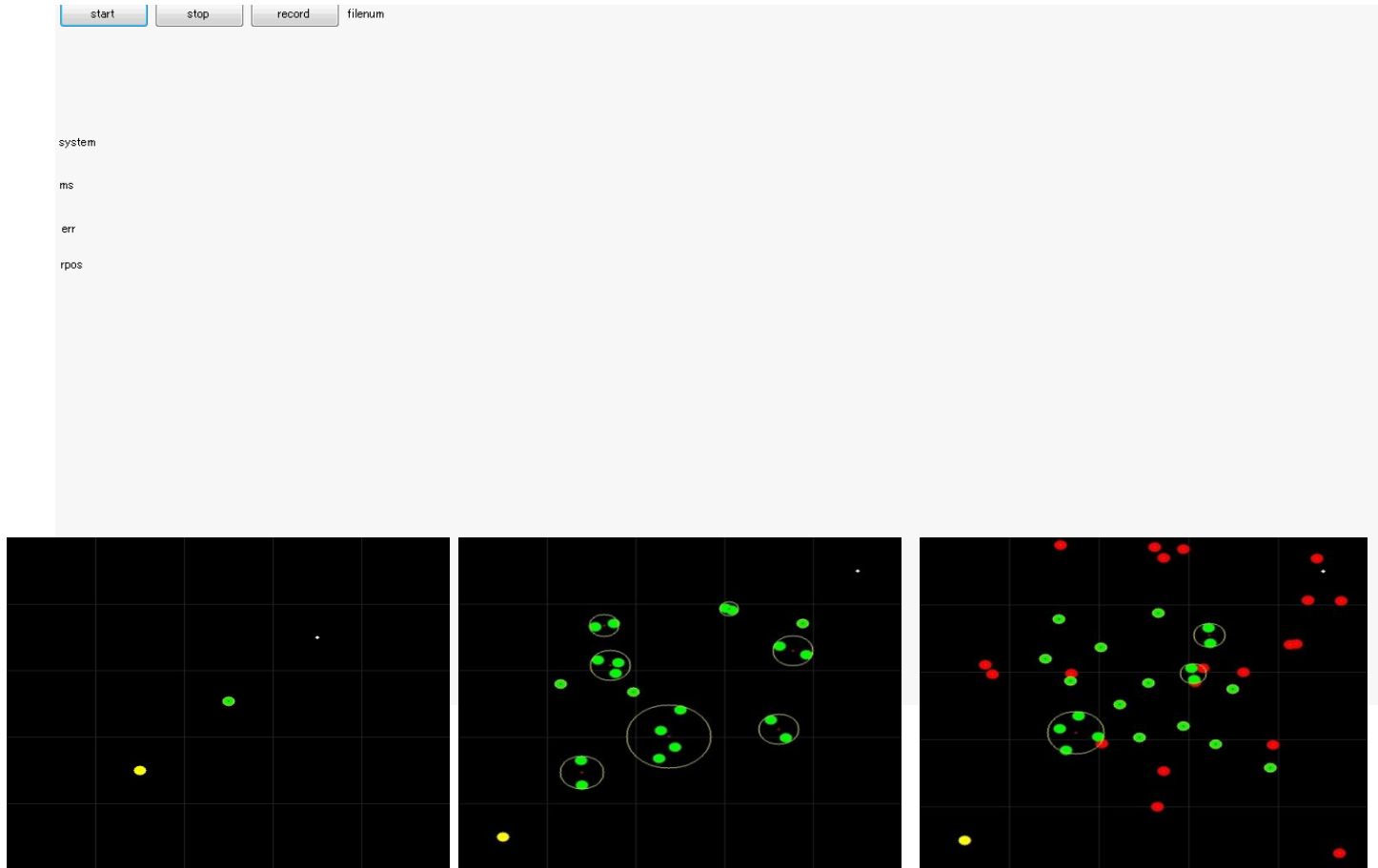
Omni-View based Visual SLAM

An omni-view based Visual SLAM for precise localization



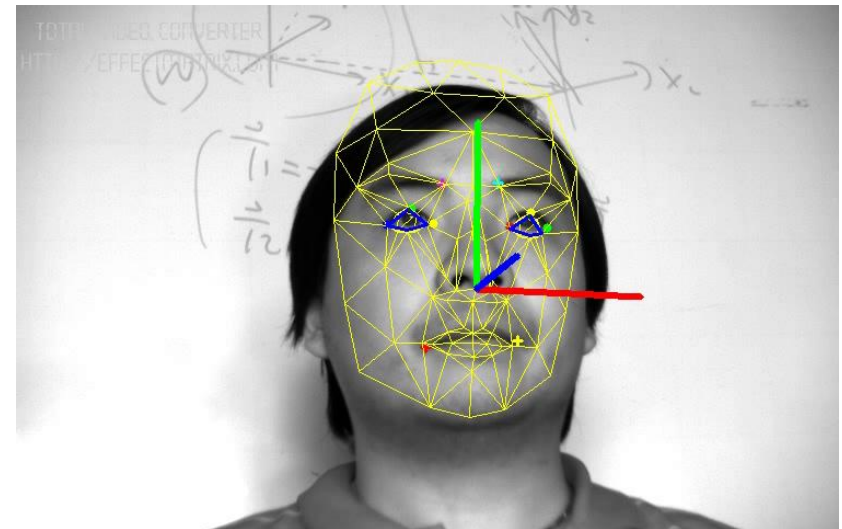
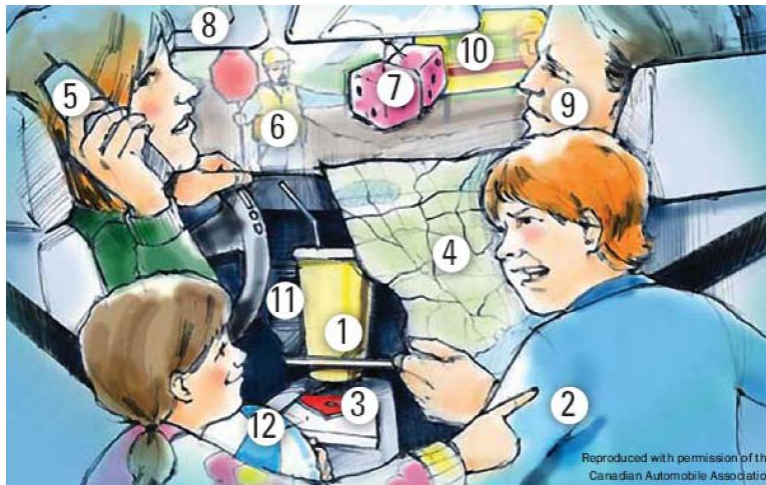
SLAM based indoor EV navigation

- ▶ SLAM based localization and collision avoidance



漫然運転の防止 Driver Inattention Monitoring

- ▶ A real-time driver inattention (both distraction and fatigue) monitoring system is implemented with our Zero-order binocular EKF face tracker



運転行為の解析 Driving Behavior Modeling & Analysis

- ▶ Driving Simulator based analysis research including dynamical vision evaluation, vehicle HMI evaluation, etc.



STAVi: new mobility for elder society



THANK YOU

ありがとうございました



お問い合わせ先

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New Mobility for Elder Society: **STAVi**

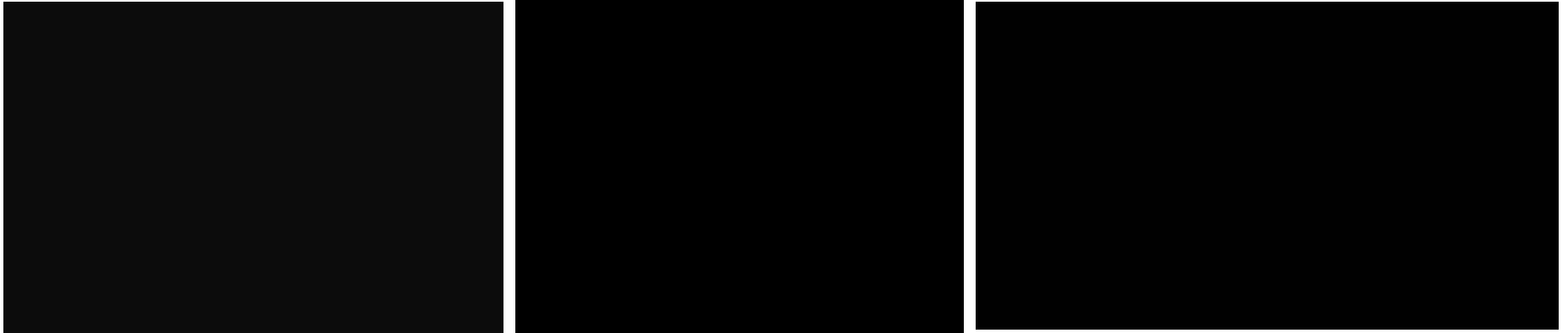
A Platform of Personal Standing Electronic Vehicle

STAVi: new mobility for elder society



The Platform

- ❑ A new mobility tool for elder people
- ❑ Two-wheel drive no-handle Electrical vehicle
- ❑ To help elder and disable person to return to the society as free living space
- ❑ Project started in 2010



Sensing Ability of STAVi



Sensing and Perception

- ❑ Lidar / visual SLAM
- ❑ Pedestrian and obstacle detection and avoidance
- ❑ Indoor localization and navigation
- ❑ Comprehensive risk analysis

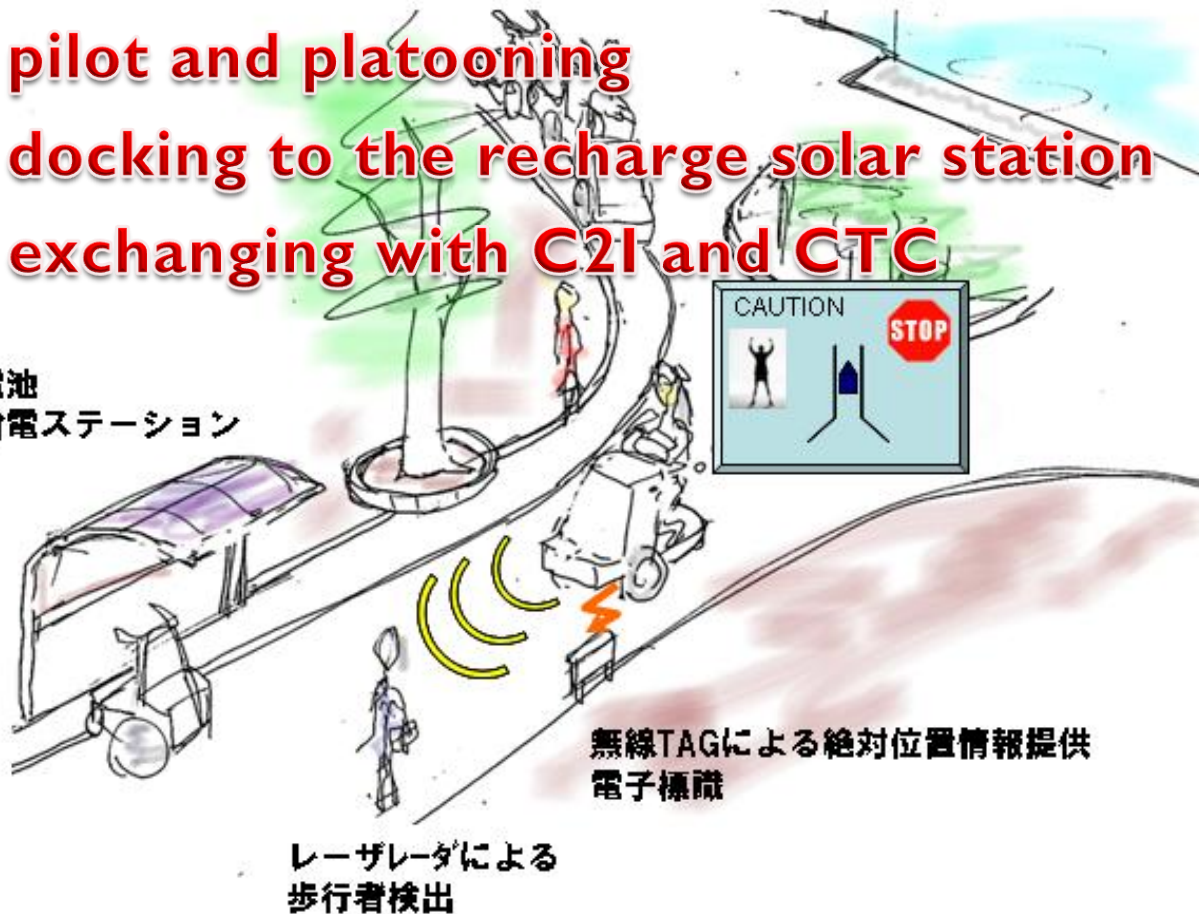


In the campus what we are planning to do

隊列回収モード

- Auto pilot and platooning
- Auto docking to the recharge solar station
- Data exchanging with C2I and CTC

• ... 太陽電池
自動給電ステーション



THANK YOU

ありがとうございました



お問い合わせ先

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